

CLAIMS

1. A production method for a group III nitride crystal, being characterized by comprising the steps of:

5 growing a group III nitride crystal film on a substrate;
 depositing a metallic film on the group III nitride crystal film;
 not only generating a pore in the metallic film but also forming a void
portion in the group III nitride crystal film by thermally treating the substrate
on which the group III nitride crystal film is grown and the metallic film is
10 deposited;

 growing a group III nitride crystal for filling on the group III nitride
crystal film in which the void portion is formed in an atmosphere of an oxygen
concentration of 0.1% by mol or less to fill the void portion in the group III
nitride crystal film; and

15 growing a group III nitride crystal on the metallic film in an
atmosphere of an oxygen concentration of 0.1% by mol or less.

2. A production method for a group III nitride crystal, being characterized by comprising the steps of:

 growing a group III nitride crystal film on a substrate;
20 depositing a metallic film on the group III nitride crystal film;
 not only changing the metallic film into a metallic nitride film and,
further, generating a pore in the metallic film, but also forming a void portion
in the group III nitride crystal film by thermally treating the substrate on

which the group III nitride crystal film is grown and the metallic film is deposited;

growing a group III nitride crystal for filling on the group III nitride crystal film in which the void portion is formed in an atmosphere of an oxygen
5 concentration of 0.1% by mol or less to fill the void portion in the group III nitride crystal film; and

growing a group III nitride crystal on the metallic nitride film in an atmosphere of an oxygen concentration of 0.1% by mol or less.

3. The production method for the group III nitride crystal as set forth
10 in Claim 1 or 2, being characterized by forming the atmosphere of an oxygen concentration of 0.1% by mol or less at the time of growing the group III nitride crystal for filling and/or the group III nitride crystal, by at least one of a method of using an H₂ gas and a method of using carbon.

4. The production method for the group III nitride crystal as set forth
15 in any one of Claims 1 to 3, wherein the group III nitride crystal is an Al_xGa_yIn_{1-x-y}N crystal (0≤x, 0≤y, x+y≤1).

5. The production method for the group III nitride crystal as set forth in any one of Claims 1 to 4, wherein the metallic film comprises titanium, vanadium or an alloy comprising at least one of titanium and vanadium.

20 6. The production method for the group III nitride crystal as set forth in any one of Claims 1 to 5, wherein thickness of the metallic film is from 10 nm to 1000 nm.

7. The production method for the group III nitride crystal as set forth

in any one of Claims 1 to 6, being characterized by further removing the substrate to obtain only the group III nitride crystal grown on the metallic film of the substrate.

8. A production method for a group III nitride crystal, being
5 characterized by further comprising the step of growing a group III nitride crystal in an oxygen atmosphere of 0.1% by mol or less on the group III nitride crystal obtained by the method as set forth in any one of Claims 1 to 7.

9. A group III nitride crystal, being obtained by the method for obtaining the group III nitride crystal as set forth in any one of Claims 1 to 8.